Water Quality Assessment
the Yampa River
Town of Hayden Town of Hayden Wastewater Treatment FacilityWWTF

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I. Water Quality Assessment Summary

Table A-1 includes summary information related to this WQA. This summary table includes key regulatory starting points used in development of the WQA such as: receiving stream information; threatened and endangered species; 303(d) and Monitoring and Evaluation listings; low flow and facility flow summaries; and a list of parameters evaluated.

Table A-1
WQA Summary

Facility Information

Facility Name	Permit Number	Design Flow (max 30-day ave, MGD)	Design Flow (max 30-day ave, CFS)
F1. Town of Hayden Wastewater Treatment Facility	CO0040959	0.75	1.2

Receiving Stream Information

Receiving Stream Name	Segment ID	Designation	Classification(s)
S1. Dry Creek	COUCYA13h	Use Protected	Aquatic Life Warm 2 Recreation Class E Agriculture
S2. the Yampa River	COUCYA02b	Undesignated	Aquatic Life Cold 1 Recreation Class E Agriculture Water Supply

Low Flows (cfs)

Receiving Stream Name	1E3 (1-day)	7E3 (7-day)	30E3 (30-day)	Ratio of 30E3 to the Design Flow (cfs)
S1. Dry Creek	0	0	0	F1: 0:1
S2. the Yampa River	62	77	102	F1: 85:1

Regulatory Information

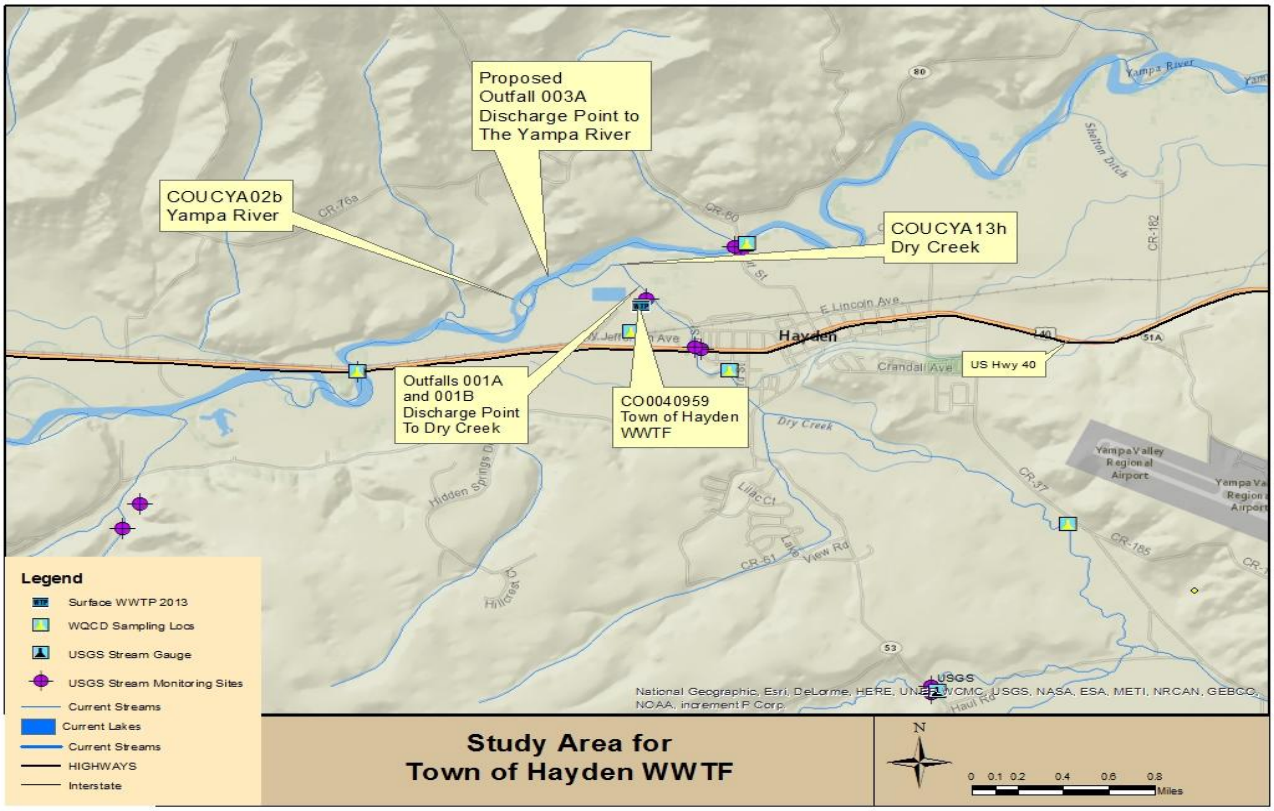
T&E Species	303(d) (Reg 93)	Monitor and Eval (Reg 93)	Existing TMDL	Temporary Modification	Control Regulation
S1. No	COUCYA13d (Dry Ck) - Fe (Trec) snowmelt season all portions - Se below Seneca sample location 8 WSD5	COUCYA13d (Dry Ck)- Pb & E. coli below Routt County Rd 53	No	None	None
S2. No	None	Temperature	No	Temporary modification: As(ch)=hybrid Expiration date	None

				of 12/31/21.	
Pollutants Evaluated					
F1: Ammonia, E. Coli, TRC, Nitrate, Se, Fe(Trec)					

II. Introduction

The water quality assessment (WQA) of Dry Creek and the Yampa River near the Town of Hayden Wastewater Treatment Facility (WWTF), located in Routt County, is intended to determine the assimilative capacities available for pollutants found to be of concern. This WQA describes how the water quality based effluent limits (WQBELs) are developed. These parameters may or may not appear in the permit with limitations or monitoring requirements, subject to other determinations such as reasonable potential analysis, evaluation of federal effluent limitation guidelines, implementation of state-based technology based limits, mixing zone analyses, 303(d) listings, threatened and endangered species listing, or other requirements as discussed in the permit rationale. Figure A-1 contains a map of the study area evaluated as part of this WQA.

FIGURE A-1



The Town of Hayden WWTF discharges to Dry Creek which is stream segment COUCYA13h. This means the Upper Colorado River Basin, Yampa River Sub-basin, Stream Segment 13h. This segment is composed of the "Mainstem of Dry Creek, including all tributaries and wetlands from the confluence with Temple Gulch to the confluence with the Yampa River near Hayden.". Stream segment COUCYA13h is classified for Aquatic Life Warm 2, Recreation Class E, and Agriculture.

The Town of Hayden also discharges to the Yampa River, which is stream segment COUCYA02b. This means the Upper Colorado River Basin, Yampa River Sub-basin, Stream Segment 02b. This segment is composed of the "Mainstem of theYampa River from a point immediately above the confluence with Oak Creek to a point immediately below the confluence with Elkhead Creek.". Stream segment COUCYA02b is classified for Aquatic Life Cold 1, Recreation Class E, Water Supply and Agriculture.

Note that the segments to which Hayden discharges have recently changed as a result of the WQCC Hearing for the Upper and Lower Colorado River Basins. The Water Quality Control Commission has recently completed a preliminary final action concerning the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12).* Both the Yampa River and Dry Creek were resegmented. The Yampa River segment changed from COUCYA02c to COUCYA02b. The Dry Creek segment changed from COUCYA13d to COUCYA13h. As these changes are very recent, Regulation 93 has not been updated to reflect these changes. Therefore, the former stream segment qualifiers will be considered for this section

The Town of Hayden WWTF has multiple discharge points. The current discharge point for the months of November to May is located at 40.492981^{o}N, 107.272997^{o}W. The current discharge point for the months of November to May has tiered limits. Outfall 001A is used when discharging at flows less than 0.25MGD. Outfall 001B is used when discharging at flows greater than 0.25 MGD. The primary receiving stream for outfalls 001A and 001B is Dry Creek, which is stream segment COUCYA13h. This discharge point is approximately 0.5 miles away from the confluence of Dry Creek with the Yampa River. The discharge does flow to the Yampa River. Therefore, the Yampa River stream segment COUCYA02b is also considered in this WQA for the outfalls 001A and 001B.

The Town of Hayden has received site approval and a funding for a new proposed outfall 003A at 40.497594^{o}N, 107.273158^{o}W, which will discharge directly into the Yampa River at stream segment COUCYA02b. This outfall is expected to become functional and become the primary discharge point during the months of November to May within the year 2016. The downstream segment is over 10 miles away, and due to the large amount of dilution in the Yampa River, the downstream segment is not considered further in this WQA.

Information used in this assessment includes data gathered from the Town of Hayden Wastewater Treatment Facility, the Division, the Colorado Division of Water Resources (DWR), Riverwatch, the U.S. Environmental Protection Agency (EPA), the U.S. Geological Survey (USGS), the U.S. Census Bureau and communications with the local water commissioner. The data used in the assessment consist of the best information available at the time of preparation of this WQA analysis.

III. Water Quality Standards

Narrative Standards

Narrative Statewide Basic Standards have been developed in Section 31.11(1) of the regulations, and apply to any pollutant of concern, even where there is no numeric standard for that pollutant. Waters of the state shall be free from substances attributable to human-caused point source or nonpoint source discharges in amounts, concentrations or combinations which:

for all surface waters except wetlands;

(i) can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom buildup of materials which include but are not limited to anaerobic sludge, mine slurry or tailings, silt, or mud; or (ii) form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or (iii) produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or (iv) are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or (v) produce a predominance of undesirable aquatic life; or (vi) cause a film on the surface or produce a deposit on shorelines; and

for surface waters in wetlands;

(i) produce color, odor, changes in pH, or other conditions in such a degree as to create a nuisance or harm water quality dependent functions or impart any undesirable taste to significant edible aquatic species of the wetland; or (ii) are toxic to humans, animals, plants, or aquatic life of the wetland.

In order to protect the Basic Standards in waters of the state, effluent limitations and/or monitoring requirements for any parameter of concern could be put in CDPS discharge permits.

Standards for Organic Parameters and Radionuclides

Radionuclides: Statewide Basic Standards have been developed in Section 31.11(2) and (3) of The Basic Standards and Methodologies for Surface Water to protect the waters of the state from radionuclides and organic chemicals.

In no case shall radioactive materials in surface waters be increased by any cause attributable to municipal, industrial, or agricultural practices or discharges to as to exceed the following levels, unless alternative site-specific standards have been adopted. Standards for radionuclides are shown in Table A-2.

Table A-2
Radionuclide Standards

Parameter	Picocuries per Liter
Americium 241*	0.15

Cesium 134	80
Plutonium 239, and 240*	0.15
Radium 226 and 228*	5
Strontium 90*	8
Thorium 230 and 232*	60
Tritium	20,000

*Radionuclide samples for these materials should be analyzed using unfiltered (total) samples. These Human Health based standards are 30-day average values.

Organics: The organic pollutant standards contained in the Basic Standards for Organic Chemicals Table are applicable to all surface waters of the state for the corresponding use classifications, unless alternative site-specific standards have been adopted. These standards have been adopted as "interim standards" and will remain in effect until alternative permanent standards are adopted by the Commission. These interim standards shall not be considered final or permanent standards subject to antibacksliding or downgrading restrictions. Although not reproduced in this WQA, the specific standards for organic chemicals can be found in Regulation 31.11(3).

In order to protect the Basic Standards in waters of the state, effluent limitations and/or monitoring requirements for radionuclides, organics, or any other parameter of concern could be put in CDPS discharge permits.

The aquatic life standards for organics apply to all stream segments that are classified for aquatic life. The water supply standards apply only to those segments that are classified for water supply. The water + fish standards apply to those segments that have a Class 1 aquatic life and a water supply classification. The fish ingestion standards apply to Class 1 aquatic life segments that do not have a water supply designation. The water + fish and the fish ingestion standards may also apply to Class 2 aquatic life segments, where the Water Quality Control Commission has made such determination.

Because Dry Creek is classified for Aquatic Life Warm 2, without a water supply designation, the aquatic life standards apply to this discharge.

Because the the Yampa River is classified for Aquatic Life Cold 1, with a water supply designation, the water + fish, and aquatic life standards apply to this discharge.

Salinity and Nutrients

Salinity: Regulation 61.8(2)(l) contains requirements regarding salinity for any discharges to the Colorado River Watershed. For industrial dischargers and for the discharge of intercepted groundwater, this is a no-salt discharge requirement. However, the regulation states that this requirement may be waived where the salt load reaching the mainstem of the Colorado River is less than 1 ton per day, or less than 350 tons per year. The Division may permit the discharge of salt upon a satisfactory demonstration that it is not practicable to prevent the discharge of all salt. See Regulation 61.8(2)(l)(i)(A)(1) for industrial discharges and 61.8(2)(l)(iii) for discharges of intercepted groundwater for more information regarding this demonstration.

For municipal dischargers, an incremental increase of 400 mg/l above the flow weighted averaged salinity of the intake water supply is allowed. This may be waived where the salt load reaching the mainstem of the Colorado River is less than 1 ton per day, or less than 366 tons per year. The Division may permit the discharge of salt in excess of the 400 mg/l incremental increase, upon a satisfactory demonstration that it is not practicable to attain this limit. See Regulation 61.8(2)(l)(vi)(A)(1) for more information regarding this demonstration.

In addition, the Division's policy, Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops, may be applied to discharges where an agricultural water intake exists downstream of a discharge point. Limitations for electrical conductivity and sodium absorption ratio may be applied in accordance with this policy.

Nutrients

Phosphorus: Regulations 71, 72, 73 and 74, for Dillon Reservoir Watershed, Cherry Creek Reservoir Watershed, Chatfield Reservoir Watershed and the Bear Creek Watershed, contain requirements for phosphorus concentrations and phosphorus annual loadings for point source dischargers. If a facility discharges to one of these watersheds, a phosphorus allocation may be necessary, and limitations and annual loadings may be added to a permit.

Phosphorus and Total Inorganic Nitrogen: Regulation 85, the *Nutrients Management Control Regulation* has been adopted by the Water Quality Control Commission and became effective September 30, 2012. This regulation contains requirements for phosphorus and Total Inorganic Nitrogen (TIN) concentrations for some point source dischargers. Limitations for phosphorus and TIN may be applied in accordance with this regulation.

Temperature

Temperature shall maintain a normal pattern of diurnal and seasonal fluctuations with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deemed deleterious to the resident aquatic life. This standard shall not be interpreted or applied in a manner inconsistent with section 25-8-104, C.R.S.

Segment Specific Numeric Standards

Numeric standards are developed on a basin-specific basis and are adopted for particular stream segments by the Water Quality Control Commission. The standards in Table A-3a have been assigned to stream segment COUCYA13h in accordance with the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)*. The standards in Table A-3b have been assigned to stream segment COUCYA02b.

An amendment to the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)* that becomes effective on December 31, 2014, will change the applicable standards for stream segment COUCYA13h and COUCYA02b. This WQA has been developed in conformance with the water quality standards that will become effective on December 31,

2014, as any permitting action based on this WQA would take effect immediately after (or just prior) to the effective date of this regulation.

Table A-3a **In-stream Standards for Stream Segment COUCYA13h Dry Creek**
Physical and Biological
Dissolved Oxygen (DO) = 5 mg/l, minimum
pH = 6.5 - 9 su
E. coli chronic = 126 colonies/100 ml
Temperature March-Nov = 27.5° C MWAT and 28.6° C DM
Temperature Dec-Feb = 13.8° C MWAT and 14.3° C DM
Inorganic
Total Ammonia acute and chronic = TVS
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite acute = 0.05 mg/l
Nitrate acute = 100 mg/l
Metals
Total Recoverable Aluminum acute and chronic = TVS
Dissolved Arsenic acute = 340 µg/l
Total Recoverable Arsenic chronic = 100 µg/l
Dissolved Cadmium acute and chronic = TVS
Total Recoverable Trivalent Chromium chronic = NA µg/l
Dissolved Trivalent Chromium acute and chronic = TVS
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Total Recoverable Iron chronic = 1000 µg/l
Dissolved Lead acute and chronic = TVS
Dissolved Manganese acute and chronic = TVS
Total Recoverable Molybdenum chronic = 210 µg/l
Total Mercury chronic = 0.01 µg/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and chronic = TVS
Dissolved Zinc acute and chronic = TVS

Table A-3b **In-stream Standards for Stream Segment COUCYA02b Yampa River**
Physical and Biological
Dissolved Oxygen (DO) = 6 mg/l, minimum (7 mg/l, minimum during spawning)
pH = 6.5 - 9 su
E. coli chronic = 126 colonies/100 ml
Temperature April-Oct =18.3° C MWAT and 23.9° C DM
Temperature Nov-March = 9° C MWAT and 13° C DM
Inorganic
Total Ammonia acute and chronic = TVS
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite acute = 0.05 mg/l
Nitrate acute = 10 mg/l
Chloride chronic = 250 mg/l
Sulfate chronic = For WS, the greater of ambient water quality as of January 1, 2000 or 250 mg/l
Metals
Total Recoverable Aluminum acute and chronic = TVS
Dissolved Arsenic acute = 340 µg/l
Total Recoverable Arsenic chronic = 0.02 µg/l
Dissolved Cadmium acute for trout and Dissolved Cadmium chronic = TVS
Total Recoverable Trivalent Chromium acute = 50 µg/l
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Total Recoverable Iron chronic = 1000 µg/l
Dissolved Lead acute and chronic = TVS
Dissolved Manganese acute and chronic = TVS
Total Recoverable Molybdenum chronic = 210 µg/l
Total Mercury chronic = 0.01 µg/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and Dissolved Silver chronic for trout = TVS
Dissolved Zinc acute and chronic = TVS
Nonylphenol acute = 28 µg/l
Nonylphenol chronic = 6.6 µg/l

Table Value Standards and Hardness Calculations

As metals with standards specified as TVS are not included as parameters of concern for this facility, the hardness value of the receiving water and the subsequent calculation of the TVS equations is inconsequential and is therefore omitted from this WQA.

Total Maximum Daily Loads and Regulation 93 – Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List

The Water Quality Control Commission has recently completed a preliminary final action concerning the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12).* Both the Yampa River and Dry Creek were resegmented. The Yampa River segment changed from COUCYA02c to COUCYA02b. The Dry Creek segment changed from COUCYA13d to COUCYA13h. As these changes are very recent, Regulation 93 has not been updated to reflect these changes. Therefore, the former stream segment qualifiers will be considered for this section.

Stream segment COUCYA02c is listed for monitoring and evaluation for temperature. According to Division standard procedure, the Division's Environmental Data Unit investigates issues of water quality standard exceedances. If it is determined that the water body is impaired, the segment will be added to the 303(d) list. At a minimum, the permit may contain monitoring requirements to support a future TMDL if the segment is listed.

Stream segment COUCYA13d is listed for monitoring and evaluation for lead and E. coli. According to Division standard procedure, the Division's Environmental Data Unit investigates issues of water quality standard exceedances. If it is determined that the water body is impaired, the segment will be added to the 303(d) list. At a minimum, the permit may contain monitoring requirements to support a future TMDL if the segment is listed.

Stream segment COUCYA13d is on the 303(d) list of water quality impacted streams for total recoverable iron and dissolved selenium.

For a receiving water placed on this list, the Restoration and Protection Unit is tasked with developing the Total Maximum Daily Loads (TMDLs) and the Waste Load Allocation (WLAs) to be distributed to the affected facilities. WLAs for total recoverable iron and dissolved selenium have not yet been established and the allowable concentration calculated in the following sections may change upon further evaluation by the Division.

IV. Receiving Stream Information

Low Flow Analysis

The Colorado Regulations specify the use of low flow conditions when establishing water quality based effluent limitations, specifically the acute and chronic low flows. The acute low flow, referred to as 1E3, represents the one-day low flow recurring in a three-year interval, and is used in developing limitations

based on an acute standard. The 7-day average low flow, 7E3, represents the seven-day average low flow recurring in a 3 year interval, and is used in developing limitations based on a Maximum Weekly Average Temperature standard (MWAT). The chronic low flow, 30E3, represents the 30-day average low flow recurring in a three-year interval, and is used in developing limitations based on a chronic standard.

Dry Creek Low Flow Analysis

Although there is periodic flow in Dry Creek upstream of the Town of Hayden WWTF, the 1E3 7E3 and 30E3 monthly low flows are set at zero based on information in *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)* For this analysis, low flows are summarized in Table A-4a.

Table A-4a

Low Flows for Dry Creek at the Town of Hayden WWTF

Low Flow (cfs)	*Annual*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
1E3 Acute	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7E3 Chronic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30E3 Chronic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The ratio of the low flow of Dry Creek to the Town of Hayden Wastewater Treatment Facility WWTF design flow is 0:1

Yampa River Low Flow Analysis

To determine the low flows available to the Town of Hayden Wastewater Treatment Facility WWTF, USGS gage station 09244490 (Yampa River above Elkhead Creek) was used. This flow gage provides a representative measurement of the upstream flow because there are no diversions or confluence of significance between the flow gage and the facility. Even though this gauge station is downstream from the Town of Hayden WWTF, the amount of flow the Town of Hayden WWTF contributes is very minimal as it is a domestic minor facility and discharges below the design capacity of 0.75 mgd.

Daily flows from the USGS Gage Station 09244490 (Yampa River above Elkhead Creek) were obtained and the annual 1E3 and 30E3 low flows were calculated using U.S. Environmental Protection Agency (EPA) DFLOW software. The output from DFLOW provides calculated acute and chronic low flows for each month.

Flow data from March 2004 through October 2014 were available from the gage station. The gage station and time frames were deemed the most accurate and representative of current flows and were therefore used in this analysis.

Based on the low flow analysis described previously, the upstream low flows available to the Town of Hayden Wastewater Treatment Facility WWTF were calculated and are presented in Table A-4b.

Table A-4b

Low Flows for the Yampa River at the Town of Hayden WWTF

Low Flow (cfs)	*Annual*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
1E3 Acute	62	89	94	119	161	368	133	105	70	62	88	118	65
7E3 Chronic	77	105	107	119	161	368	141	105	77	77	91	118	100
30E3 Chronic	102	112	116	119	161	368	174	105	102	102	102	118	112

The ratio of the low flow of the Yampa River to the Town of Hayden Wastewater Treatment Facility WWTF design flow is 85:1

Mixing Zones

The amount of the available assimilative capacity (dilution) that may be used by the permittee for the purposes of calculating the WQBELs may be limited in a permitting action based upon a mixing zone analysis or other factor. These other factors that may reduce the amount of assimilative capacity available in a permit are: presence of other dischargers in the vicinity; the presence of a water diversion downstream of the discharge (in the mixing zone); the need to provide a zone of passage for aquatic life; the likelihood of bioaccumulation of toxins in fish or wildlife; habitat considerations such as fish spawning or nursery areas; the presence of threatened and endangered species; potential for human exposure through drinking water or recreation; the possibility that aquatic life will be attracted to the effluent plume; the potential for adverse effects on groundwater; and the toxicity or persistence of the substance discharged.

Unless a facility has performed a mixing zone study during the course of the previous permit, and a decision has been made regarding the amount of the assimilative capacity that can be used by the facility, the Division assumes that the full assimilative capacity can be allocated. Note that the review of mixing study considerations, exemptions and perhaps performing a new mixing study (due to changes in low flow, change in facility design flow, channel geomorphology or other reason) is evaluated in every permit and permit renewal.

If a mixing zone study has been performed and a decision regarding the amount of available assimilative capacity has been made, the Division may calculate the water quality based effluent limitations

(WQBELs) based on this available capacity. In addition, the amount of assimilative capacity may be reduced by T&E implications.

Dry Creek:
Since the receiving stream has a zero low flow as calculated above, the WQBELs would be equal to the WQS, and therefore consideration of full or reduced assimilative capacity is inconsequential.

Yampa River:
For this facility, 100% of the available assimilative capacity may be used as the facility has not had to perform a mixing zone study and the discharge is not to a T&E stream segment, and is not expected to have an influence on any of the other factors listed above.

Ambient Water Quality

Dry Creek:
The Division evaluates ambient water quality based on a variety of statistical methods as prescribed in Section 31.8(2)(a)(i) and 31.8(2)(b)(i)(B) of the *Colorado Department of Public Health and Environment Water Quality Control Commission Regulation No. 31*, and as outlined in the Division's Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards Based Effluent Limits (WQP-19). The ambient water quality was not assessed for Dry Creek because the background in-stream low flow condition is zero, and because no ambient water quality data are available for Dry Creek upstream of the Town of Hayden WWTF discharge.

Yampa River:
The Division evaluates ambient water quality based on a variety of statistical methods as prescribed in Section 31.8(2)(a)(i) and 31.8(2)(b)(i)(B) of the *Colorado Department of Public Health and Environment Water Quality Control Commission Regulation No. 31*, and as outlined in the Division's Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards Based Effluent Limits (WQP-19). Ambient water quality is evaluated in this WQA analysis for use in determining assimilative capacities and in completing antidegradation reviews for pollutants of concern, where applicable.

To conduct an assessment of the ambient water quality upstream of the discharge location on the Yampa River from the Town of Hayden WWTF, Division data was used from the most recent stream segment and standards assessment for the most recent update to Regulation 33 *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12).*

Note that although these data are based on samples collected at several locations on the Yampa River near Hayden, they are comparable to data representative of upstream water quality. A summary of these data is presented in Table A-5.

Table A-5

Ambient Water Quality for the Yampa River

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Maximum*	*Chronic Stream Standard*
E. coli (#/100 ml)	3	1	1	1	1	1	126
Nitrate as N (mg/l)*	6	0.026	0.14	0.27	0.15	0.3	10

* Values for Nitrate were not available, therefore values for Nitrate +Nitrite were used for the Nitrate ambient water quality evaluation.

V. Facility Information and Pollutants Evaluated

Facility Information

The Town of Hayden Wastewater Treatment Facility WWTF is located at in the NW 1/4 of the NW 1/4 of S9, T6N, R90W; 1200 West Jefferson Ave in Hayden, CO 81639; at 40.498056° latitude North and 107.274722° longitude West in Routt County. The current design capacity of the facility is 0.75 MGD (1.2 cfs). Wastewater treatment is accomplished using aerated lagoons. The technical analyses that follow include assessments of the assimilative capacity based on this design capacity.

An assessment of Division records indicate that there are several facilities discharging to the same stream segment or other stream segments immediately upstream or downstream from this facility. Several of these facilities are covered by general permits and have limitations set at the water quality standards. These facilities were not modeled in this WQA as they have a minimal impact on the ambient water quality. Some facilities, although on the same stream segment, actually discharge to a different receiving stream and therefore were not considered in this WQA. Other facilities were located more than twenty miles from the Town of Hayden Wastewater Treatment Facility WWTF and thus were not considered. The nearest dischargers were:

- Town of Milner WWTF, which discharges to the Yampa River approximately 20 miles upstream from the Dry Creek's point of confluence with the Yampa River.
- City of Craig WWTF, which discharges to the Yampa River approximately 22 miles downstream from Dry Creek's point of confluence with the Yampa River.

Due to the distance between facilities, the ambient water quality background concentrations used in the mass-balance equation (as described in the following section) account for pollutants of concern contributed by upstream sources, and therefore it was not necessary to model upstream dischargers together with the Town of Hayden Wastewater Treatment Facility WWTF when determining the available assimilative capacities in the Yampa River. Due to the distance traveled and the significant dilution of the receiving stream modeling downstream facilities in conjunction with the Town of Hayden Wastewater Treatment Facility WWTF was not necessary.

Pollutants of Concern

Pollutants of concern may be determined by one or more of the following: facility type; effluent characteristics and chemistry; effluent water quality data; receiving water quality; presence of federal effluent limitation guidelines; or other information. Parameters evaluated in this WQA may or may not appear in a permit with limitations or monitoring requirements, subject to other determinations such as a reasonable potential analysis, mixing zone analyses, 303(d) listings, threatened and endangered species listings or other requirement as discussed in a permit rationale.

There are no site-specific in-stream water quality standards for BOD_5 or $CBOD_5$, TSS, percent removal, and oil and grease for this receiving stream. Thus, assimilative capacities were not determined for these parameters. The applicable limitations for these pollutants can be found in Regulation No. 62 and will be applied in the permit for the WWTF.

The following parameters were identified by the Division as pollutants to be evaluated for this facility:

- Total Residual Chlorine
- *E. coli*
- Nitrate as Total Inorganic Nitrogen
- Ammonia
- Temperature
- Potentially Dissolved Selenium
- Total Recoverable Iron
- TDS

Based upon the size of the discharge, the lack of industrial contributors, dilution provided by the receiving stream and the fact that no unusually high metals concentrations are expected to be found in the wastewater effluent, metals are not evaluated further in this water quality assessment. However, potentially dissolved selenium and total recoverable iron are included for the discharge to Dry Creek, as they are listed on the 303d list of impaired waters for Dry Creek.

According to the *Rationale for Classifications, Standards and Designations of the Upper Colorado River,* stream segment COUCYA02b is designated a water supply because there could be alluvial wells in the area. Thus, the nitrate standard is further evaluated as part of this WQA.

During assessment of the facility, nearby facilities, and receiving stream water quality, no additional parameters were identified as pollutants of concern.

VI. Determination of Water Quality Based Effluent Limitations (WQBELs)

Technical Information

Note that the WQBELs developed in the following paragraphs, are calculations of what an effluent limitation may be in a permit. The WQBELs for any given parameter, will be compared to other potential limitations (federal effluent limitations guidelines, state effluent limitations, or other applicable limitation) and typically the more stringent limit is incorporated into a permit. If the WQBEL is the more stringent limitation, incorporation into a permit is dependent upon a reasonable potential analysis.

In-stream background data and low flows evaluated in Sections II and III are used to determine the assimilative capacity of the Yampa River near the Town of Hayden Wastewater Treatment Facility WWTF for pollutants of concern, and to calculate the WQBELs. For all parameters except ammonia, it is the Division's approach to calculate the WQBELs using the lowest of the monthly low flows (referred to as the annual low flow) as determined in the low flow analysis. For ammonia, it is the standard procedure of the Division to determine monthly WQBELs using the monthly low flows, as the regulations allow the use of seasonal flows.

The Division's standard analysis consists of steady-state, mass-balance calculations for most pollutants and modeling for pollutants such as ammonia. The mass-balance equation is used by the Division to calculate the WQBELs, and accounts for the upstream concentration of a pollutant at the existing quality, critical low flow (minimal dilution), effluent flow and the water quality standard. The mass-balance equation is expressed as:

$$M_2 = \frac{M_3 Q_3 - M_1 Q_1}{Q_2}$$

Where,

Q_1 = Upstream low flow (1E3 or 30E3)
Q_2 = Average daily effluent flow (design capacity)
Q_3 = Downstream flow ($Q_1 + Q_2$)
M_1 = In-stream background pollutant concentrations at the existing quality
M_2 = Calculated WQBEL
M_3 = Water Quality Standard, or other maximum allowable pollutant concentration

The upstream background pollutant concentrations used in the mass-balance equation will vary based on the regulatory definition of existing ambient water quality. For most pollutants, existing quality is determined to be the 85th percentile. For metals in the total or total recoverable form, existing quality is determined to be the 50th percentile. For pathogens such as fecal coliform and *E. coli*, existing quality is determined to be the geometric mean.

For temperature, the highest 7-day mean (for the chronic standard) of daily average stream temperature, over a seven consecutive day period will be used in calculations of the chronic temperature assimilative capacity, where the daily average temperature should be calculated from a minimum of three measurements spaced equally through the day. The highest 2-hour mean (for the acute standard) of stream temperature will be used in calculations of the acute temperature assimilative capacity. The highest 2-hour mean should be calculated from a minimum of 12 measurements spaced equally through the day.

Dry Creek Only:
When Q_1 equals zero, Q_2 equals Q_3, and the following results:

$$M_2 = M_3$$

Because the low flow (Q_1) for Dry Creek is zero, the WQBELs for Dry Creek for the pollutants of concern are equal to the in-stream water quality standards.

A more detailed discussion of the technical analysis is provided in the pages that follow.

Calculation of WQBELs

Using the mass-balance equation provided in the beginning of Section VI, the acute and chronic low flows set out in Section IV, ambient water quality as discussed in Section IV, and the in-stream standards shown in Section III, the WQBELs for were calculated. The data used and the resulting WQBELs, M_2, are set forth in Table A-7a for the chronic WQBELs and A-7b for the acute WQBELs.

Where a WQBEL is calculated to be a negative number and interpreted to be zero the Division standard procedure is to allocate the water quality standard to prevent further degradation of the receiving waters.

Chlorine: There are no point sources discharging total residual chlorine within one mile of the Town of Hayden Wastewater Treatment Facility WWTF. Because chlorine is rapidly oxidized, in-stream levels of residual chlorine are detected only for a short distance below a source. Ambient chlorine was therefore assumed to be zero.

***E. coli*:** There are no point sources discharging E. coli within one mile of the Town of Hayden Wastewater Treatment Facility WWTF. Thus, WQBELs were evaluated separately. In the absence of *E. coli* ambient water quality data, fecal coliform ambient data are used as a conservative estimate of *E. coli* existing quality. For *E. coli*, the Division establishes the 7-day geometric mean limit as two times the 30-day geometric mean WQBEL and also includes maximum limits of 2,000 colonies per 100 ml (30-day geometric mean) and 4,000 colonies per 100 ml (7-day geometric mean). This 2000 colony limitation also applies to discharges to ditches.

Temperature:

Dry Creek:
Dry Creek is a zero low flow stream, so the discharge is to an effluent dependent (ephemeral stream without the presence of wastewater) water therefore in accordance with Regulation 31.14(14), no temperature limitations are required.

Yampa River:
The 7E3 low flow was 77 cfs, resulting in a dilution ratio (7E3 low flow to effluent) of 64:1. The discharge is from a Domestic WWTF where the available dilution ratio is > 10:1. Therefore, based on the 7E3 low flow and in accordance with the Division's Temperature Policy, no temperature limitations are required.

Nitrate / Total Inorganic Nitrogen (T.I.N.): An acute nitrate standard of 10 mg/l is assigned to this segment (Yampa River). Because nitrite and ammonia can also form nitrate, compliance with the nitrate standard is achieved through imposition of a Total Inorganic Nitrogen (T.I.N.) limit. T.I.N. effectively measures nitrate and its precursors including nitrite and ammonia.

To determine the background concentration for Total Inorganic Nitrogen for use in the mass balance equation, same day samples of the ambient data for ammonia, nitrite and nitrate (or nitrite + nitrate) were added together to calculate the T.I.N. The 85th percentile of this summed data was calculated and used as the ambient water quality for T.I.N.

Dry Creek:

Outfall 001A

Table A-6a

Chronic WQBELs for Dry Creek at 0.25 MGD

Parameter	Q_1 *(cfs)*	Q_2 *(cfs)*	Q_3 *(cfs)*	M_1	M_3	M_2
E. coli (#/100 ml)	0	0.39	0.39	1	126	***126***
TRC (mg/l)	0	0.39	0.39	0	0.011	***0.011***
Fe, TR (µg/l)	0	0.39	0.39	0	1000	***1000***
Se, Dis (µg/l)	0	0.39	0.39	0	4.6	***4.6***

Table A-6b

Acute WQBELs for Dry Creek at 0.25 MGD

Parameter	Q_1 *(cfs)*	Q_2 *(cfs)*	Q_3 *(cfs)*	M_1	M_3	M_2
E. coli (#/100 ml)	0	0.39	0.39	1	252	***252***
TRC (mg/l)	0	0.39	0.39	0	0.019	***0.019***
Se, Dis (µg/l)	0	0.39	0.39	0	18.4	***18.4***

Outfall 001B

Table A-7a

Chronic WQBELs for Dry Creek at 0.75 MGD

Parameter	Q_1 *(cfs)*	Q_2 *(cfs)*	Q_3 *(cfs)*	M_1	M_3	M_2
E. coli (#/100 ml)	0	1.2	1.2	1	126	***126***
TRC (mg/l)	0	1.2	1.2	0	0.011	***0.011***
Fe, TR (µg/l)	0	1.2	1.2	0	1000	***1000***
Se, Dis (µg/l)	0	1.2	1.2	0	4.6	***4.6***

Table A-7b

Acute WQBELs for Dry Creek at 0.75 MGD

Parameter	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	M_1	M_3	M_2
E. coli (#/100 ml)	0	1.2	1.2	1	252	***252***
TRC (mg/l)	0	1.2	1.2	0	0.019	***0.019***
Se, Dis (µg/l)	0	1.2	1.2	0	18.4	***18***

Yampa River

Table A-8a

Chronic WQBELs for Yampa River at 0.75 MGD

Parameter	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	M_1	M_3	M_2
E. coli (#/100 ml)	102	1.2	103.2	1	126	***10751***
TRC (mg/l)	102	1.2	103.2	0	0.011	***0.95***

Table A-8b

Acute WQBELs for Yampa River at 0.75 MGD

Parameter	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	M_1	M_3	M_2
E. coli (#/100 ml)	62	1.2	63.2	1	252	***21502***
TRC (mg/l)	62	1.2	63.2	0	0.019	***1***
Nitrate as N (mg/l)	62	1.2	63.2	0.27	10	***513***

Ammonia: The Ammonia Toxicity Model (AMMTOX) is a software program designed to project the downstream effects of ammonia and the ammonia assimilative capacities available to each discharger based on upstream water quality and effluent discharges. To develop data for the AMMTOX model, an in-stream water quality study should be conducted of the upstream receiving water conditions, particularly the pH and corresponding temperature, over a period of at least one year.

Temperature and corresponding pH data sets reflecting upstream ambient receiving water conditions were not available for the Yamp River or Dry Creek. Stream segment standards for the Yampa River and Dry Creek established in the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)* and statistically-based, regionalized data were used to establish the setpoint and average headwater conditions in the AMMTOX model. Effluent pH data were available from the Town of Hayden WWTF and were used to establish the average facility contributions in the AMMTOX model.

There were no temperature data available for the Yampa River, Dry Creek, or the Town of Hayden WWTF that could be used as adequate input data for the AMMTOX model. Therefore, the Division standard procedure is to rely on statistically-based, regionalized data for temperature compiled from similar facilities and receiving waters.

The AMMTOX may be calibrated for a number of variables in addition to the data discussed above. The values used for the other variables in the model are listed below:

- Stream velocity = $0.3Q^{0.4d}$
- Default ammonia loss rate = 6/day
- pH amplitude was assumed to be medium
- Default times for pH maximum, temperature maximum, and time of day of occurrence
- pH rebound was set at the default value of 0.2 su per mile
- Temperature rebound was set at the default value of 0.7 degrees C per mile.

The results of the ammonia analyses for the Town of Hayden Wastewater Treatment Facility WWTF are presented in Table A-9a, Table A-9b and Table A-9c.

Table A-9a

AMMTOX Results for Dry Creek Outfall 001A
at the Town of Hayden Wastewater Treatment Facility **WWTF**

Design of 0.25 MGD (0.39 cfs)

Month	*Total Ammonia Chronic (mg/l)*	*Total Ammonia Acute (mg/l)*
January	7.7	23.0
February	7.6	22.0
March	6.9	19.0
April	2.0	6.9
May	2.5	8.8
June	2.9	12.6
July	3.5	22.0
August	3.2	17.0
September	4.5	24.0
October	6.1	23.0
November	8.6	28.0
December	7.9	24.0

Table A-9b

AMMTOX Results for Dry Creek Outfall 001B
at the Town of Hayden Wastewater Treatment Facility **WWTF**

Design of 0.75 MGD (1.2 cfs)

Month	*Total Ammonia Chronic (mg/l)*	*Total Ammonia Acute (mg/l)*
January	7.7	23.0
February	7.6	22.0
March	6.9	19.0
April	2.0	6.9
May	2.5	8.8
June	2.9	12.6
July	3.5	22.0
August	3.2	17.0
September	4.5	24.0
October	6.1	23.0
November	8.6	28.0
December	7.9	24.0

Table A-9c

AMMTOX Results for the Yampa River Outfall 003A
at the Town of Hayden Wastewater Treatment Facility WWTF

Design of 0.75 MGD (1.2 cfs)

Month	*Total Ammonia Chronic (mg/l)*	*Total Ammonia Acute (mg/l)*
January	49	70
February	50	82
March	53	104
April	67	133
May	143	286
June	84	131
July	55	117
August	56	84
September	49	65
October	45	78
November	50	100
December	48	59

Whole Effluent Toxicity (WET) Testing:

The Water Quality Control Division has established the use of WET testing as a method for

identifying and controlling toxic discharges from wastewater treatment facilities. WET testing is being utilized as a means to ensure that there are no discharges of pollutants "in amounts, concentrations or combinations which are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life" as required by Section 31.11 (1) of the Basic Standards and Methodologies for Surface Waters. The requirements for WET testing are being implemented in accordance with Division policy, Implementation of the Narrative Standard for Toxicity in Discharge Permits Using Whole Effluent Toxicity (Sept 30, 2010). Note that this policy has recently been updated and the permittee should refer to this document for additional information regarding WET.

In-Stream Waste Concentration (IWC) – Where monitoring or limitations for WET are deemed appropriate by the Division, the chronic in-stream dilution is critical in determining whether acute or chronic conditions shall apply. In accordance with Division policy, for those discharges where the chronic IWC is greater than 9.1% and the receiving stream has a Class 1 Aquatic Life use or Class 2 Aquatic Life use with all of the appropriate aquatic life numeric standards, chronic conditions will normally apply. Where the chronic IWC is less than or equal to 9.1, or the stream is not classified as described above, acute conditions will normally apply. The chronic IWC is determined using the following equation:

IWC = [Facility Flow (FF)/(Stream Chronic Low Flow (annual) + FF)] X 100%

VII. Antidegradation Evaluation

As set out in *The Basic Standards and Methodologies for Surface Water*, Section 31.8(2)(b), an antidegradation analysis is required except in cases where the receiving water is designated as "Use Protected." Note that "Use Protected" waters are waters "that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process" as set out in Section 31.8(2)(b). The antidegradation section of the regulation became effective in December 2000, and therefore antidegradation considerations are applicable to this WQA analysis.
According to the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)*, stream segment COUCYA13h (Dry Creek) is use protected. Thus, an antidegradation review not necessary for this stream segment.

According to the *Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12)*, stream segment COUCYA02b (Yampa River) is Undesignated. Thus, an antidegradation review is required for this segment if new or increased impacts are found to occur.

Introduction to the Antidegradation Process

The antidegradation process conducted as part of this water quality assessment is designed to determine if an antidegradation review is necessary and if necessary, to complete the required calculations to determine the limits that can be selected as the antidegradation-based effluent limit (ADBEL), absent further analyses that must be conducted by the facility.

As outlined in the *Antidegradation Significance Determination for New or Increased Water Quality Impacts, Procedural Guidance* (AD Guidance), the first consideration of an antidegradation evaluation is to determine if new or increased impacts are expected to occur. This is determined by a comparison of the newly calculated WQBELs verses the existing permit limitations in place as of September 30, 2000, and is described in more detail in the analysis. Note that the AD Guidance refers to the permit limitations as of September 30, 2000 as the existing limits.

If a new or increased impact is found to occur, then the next step of the antidegradation process is to go through the significance determination tests. These tests include: 1) bioaccumulative toxic pollutant test; 2) temporary impacts test; 3) dilution test (100:1 dilution at low flow) and; 4) a concentration test.

As the determination of new or increased impacts, and the bioaccumulative and concentration significance determination tests require more extensive calculations, the Division will begin the antidegradation evaluation with the dilution and temporary impact significance determination tests. These two significance tests may exempt a facility from further AD review without the additional calculations.

Note that the antidegradation requirements outlined in *The Basic Standards and Methodologies for Surface Water* specify that chronic numeric standards should be used in the antidegradation review; however, where there is only an acute standard, the acute standard should be used. The appropriate standards are used in the following antidegradation analysis.

Significance Tests for Temporary Impacts and Dilution

This is not a temporary discharge and therefore exclusion based on a temporary discharge cannot be granted and the AD evaluation must continue.

The ratio of the chronic (30E3) low flow to the design flow is 85:1, and is less than the 100:1 significance criteria. Therefore this facility is not exempt from an AD evaluation based on the dilution significance determination test, and the AD evaluation must continue.

For the determination of a new or increased impact and for the remaining significance determination tests, additional calculations are necessary. Therefore, at this point in the antidegradation evaluation, the Division will go back to the new or increased impacts test. If there is a new or increased impact, the last two significance tests will be evaluated.

New or Increased Impact and Non Impact Limitations (NILs)

To determine if there is a new or increased impact to the receiving water, a comparison of the new WQBEL concentrations and loadings verses the concentrations and loadings as of September 30, 2000 needs to occur. If either the new concentration or loading is greater than the September 2000 concentration or loading, then a new or increased impact is determined. If this is a new facility (commencement of discharge after September 30, 2000 it is automatically considered a new or increased impact.

Note that the AD Guidance document includes a step in the New or Increased Impact Test that calculates the Non-Impact Limit (NIL). The permittee may choose to retain a NIL if certain conditions are met, and therefore the AD evaluation for that parameter would be complete. As the NIL is typically greater than the ADBAC, and is therefore the chosen limit, the Division will typically conclude the AD evaluation after determining the NIL. Where the NILs are very stringent, or upon request of a permittee, the Division will calculate both the NIL and the AD limitation so that the limitations can be compared and the permittee can determine which of the two limits they would prefer, one which does not allow any increased impact (NIL), or the other which allows an insignificant impact (AD limit).

The non impact limit (NIL) is defined as the limit which results in no increased water quality impact (no increase in load or limit over the September 2000 load or limit). The NIL is calculated as the September 2000 loading, divided by the new design flow, and divided by a conversion factor of 8.34. If there is no change in design flow, then the NIL is equal to the September 2000 permit limitation.

If the facility was in place, but did not have a limitation for a particular parameter in the September 2000 permit, the Division may substitute an implicit limitation. Consistent with the First Update to the AD Guidance of April 2002, an implicit limit is determined based on the approach that specifies that the implicit limit is the maximum concentration of the effluent from October 1998 to September 2000, if such data is available. If this data is unavailable, the Division may substitute more recent representative data, if appropriate, on a case by case basis. Note that if there is a change in design flow, the implicit limit/loading is subject to recalculation based on the new design flow. For parameters that are undisclosed by the permittee, and unknown to the Division to be present, an implicit limitation may not be recognized.

This facility was in place as a discharger prior to September 30, 2000, and therefore the new or increased impacts test must be conducted. As the design flow for this facility is the same as it was in September 2000, the NILs are equal to the permit limitations as of September 2000.

For total residual chlorine and total ammonia for the months of June through December, the limitations as of September 2000 were used in the evaluation of new or increased impacts.

For E. coli and total ammonia for the months of January through May, data prior to 2000 were not available. Therefore data from May 2009 through October 2014 were determined to be representative of the AD period, as the design capacity has not changed and the discharge characteristics are expected to be similar to the discharge characteristics in the year 2000, and data from these years were used to determine the implicit limitations.

Calculation of Loadings for New or Increased Impact Test

The equations for the loading calculations are given below. Note that the AD requirements outlined in *The Basic Standards and Methodologies for Surface Water* specify that chronic numeric standards should be used in the AD review; however, where there is only an acute standard, the acute standard should be used. Thus, the chronic low flows will be used later in this AD evaluation for all parameters with a chronic standard, and the acute low flows will be used for those parameters with only an acute standard.

Previous permit load = $M_{permitted}$ *(mg/l)* × $Q_{permitted}$ *(mgd)* × *8.34*
New WQBELs load = M_2 *(mg/l)* × Q_2 *(mgd)* × *8.34*

Where,

$M_{permitted}$ = September 2000 permit limit (or implicit limit) **(mg/l)**
$Q_{permitted}$ = design flow as of September 2000 **(mgd)**
Q_2 = current design flow (same as used in the WQBEL calculations)
M_2 = new WQBEL concentration **(mg/l)**
8.34 = unit conversion factor

Table A-10 shows the results of these calculations and the determination of a new or increased impact.

Table A-10
Determination of New or Increased Impacts

Pollutant	*Sept 2000 Permit Limit*	*Sept 2000 Permit Load (lbs/day)*	*NIL*	*New WQBEL*	*New WQBEL Load (lbs/day)*	*New or Increased Impact*
E. coli (#/100 ml)	NA	NA	40	10751	67248	Yes
TRC (mg/l)	0.5	3.1	0.5	0.95	5.9	Yes
NH_3, Tot (mg/l) Jan	NA	NA	55	49	306	No
NH_3, Tot (mg/l) Feb	NA	NA	62	50	313	No
NH_3, Tot (mg/l) Mar	NA	NA	79	53	332	No
NH_3, Tot (mg/l) Apr	NA	NA	77	67	419	No
NH_3, Tot (mg/l) May	NA	NA	78	143	894	Yes
NH_3, Tot (mg/l) Jun	10.9	68	10.9	84	525	Yes
NH_3, Tot (mg/l) Jul	9.7	61	9.7	55	344	Yes
NH_3, Tot (mg/l) Aug	10.9	68	10.9	56	350	Yes
NH_3, Tot (mg/l) Sep	11	69	11	49	306	Yes
NH_3, Tot (mg/l) Oct	11.1	69	11.1	45	281	Yes
NH_3, Tot (mg/l) Nov	10.3	64	10.3	50	313	Yes
NH_3, Tot (mg/l) Dec	22.4	140	22.4	48	300	Yes

Note that loading for E. coli cannot be calculated; but, for comparison purposes, the approach is sufficient.

As shown in Table A-10, there are no new or increased impacts to the receiving stream based on the new WQBELS for total ammonia for the months of January through April and for these parameters the AD evaluation is complete and the WQBELs are the final result of this WQA.

For total residual chlorine, E. coli, and total ammonia for the months of May through December, there are new or increased impacts and in accordance with regulation, the permittee has the option of choosing

either the NIL's or ADBAC's. Because the ADBAC's are generally more stringent than NIL's, the Division assumes that the permittee will choose NIL's rather than ADBAC's, and therefore the Division will stop the AD evaluation at this point and assign the NILs to the permit. For those parameters where there is not a NIL (either implicit or explicit) the AD Guidance allows for the collection of data to determine an implicit limitation. Therefore, the permittee will be required to conduct "monitoring only" for those parameters. The permittee may request ADBAC limits. If the permittee does request ADBAC limits, the Division will proceed with the completion of this Antidegradation Analysis. Technology Based and Control Based Limitations

VIII. Technology Based and Control Based Limitations

Federal Effluent Limitation Guidelines

The Federal Effluent Limitation Guidelines for domestic wastewater treatment facilities are the secondary treatment standards. These standards have been adopted into, and are applied out of, Regulation 62, the Regulations for Effluent Limitations.

Regulations for Effluent Limitations

Regulation No. 62, the Regulations for Effluent Limitations, includes effluent limitations that apply to all discharges of wastewater to State waters, with the exception of storm water and agricultural return flows. These regulations are applicable to the discharge from the proposed discharge.

Table A-11 contains a summary of the applicable limitations for pollutants of concern at this facility.

Table A-11

Regulation 62 Based Limitations

Parameter	*30-Day Average*	*7-Day Average*	*Instantaneous Maximum*
BOD_5	30 mg/l	45 mg/l	NA
BOD_5 Percent Removal	85%	NA	NA
TSS, aerated lagoon	75 mg/l	110 mg/l	NA
Total Residual Chlorine	NA	NA	0.5 mg/l
pH	NA	NA	6.0-9.0 s.u.
Oil and Grease	NA	NA	10 mg/l

Nutrient Effluent Limitation Considerations

WQCC Regulation No. 85, the new *Nutrients Management Control Regulation*, includes technology based effluent limitations for total inorganic nitrogen and total phosphorus that currently, or will in the future, apply to many domestic wastewater discharges to State surface waters. These effluent limits for dischargers are to start being implemented in permitting actions as of July 1, 2013.

Based on Regulation No. 85, there are direct exemptions from these limitations for smaller domestic facilities that discharge less than 1 million gallons per day (MGD), or a domestic facility owned by a disadvantaged community. Since the design capacity of the Town of Hayden WWTF is 0.75 MGD, the

facility is not currently required to address the new technology based effluent limits.

However, the Division does not intend these results to discourage the Town of Hayden from working on nutrient control with the other dischargers within the Upper Colorado River watershed. These dischargers upstream and downstream of the Town of Hayden WWTF have the potential to create future nutrient issues in the Yampa River. The Division encourages these entities to all work together to create the most efficient and cost effective solutions for nutrient control in the Upper Colorado River watershed.

Supplemental Reg. 85 Nutrient Monitoring

Reg. 85 also requires that some monitoring for nutrients in wastewater effluent and streams take place, independent of what nutrient effluent limits or monitoring requirements may be established in a discharge permit. The requirements for the type and frequency of this monitoring are set forth in Reg. 85 at 85.6. This nutrient monitoring is not currently required by a permitting action, but is still required to be done by the Reg. 85 nutrient control regulation. Nutrient monitoring for the Reg. 85 control regulation is currently required to be reported to the WQCD Environmental Data Unit.

IX. References

Regulations:

The Basic Standards and Methodologies for Surface Water, Regulation 31, Colorado Department Public Health and Environment, Water Quality Control Commission, effective January 31, 2013.

Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12), Regulation No. 33, Colorado Department Public Health and Environment, Water Quality Control Commission, effective December 31, 2014

Dillon Reservoir Control Regulation, Regulation 71. Colorado Department Public Health and Environment, Water Quality Control Commission, effective May 30, 2007.

Cherry Creek Reservoir Control Regulation, Regulation 72. Colorado Department Public Health and Environment, Water Quality Control Commission, effective November 30, 2012.

Chatfield Reservoir Control Regulation, Regulation 73. Colorado Department Public Health and Environment, Water Quality Control Commission, effective March 30, 2009.

Bear Creek Watershed Control Regulation, Regulation 74. Colorado Department Public Health and Environment, Water Quality Control Commission, effective May 30, 2005.

Colorado River Salinity Standards, Regulation 39, CDPHE, WQCC (last update effective 8/30/97)

Regulations for Effluent Limitations, Regulation 62, CDPHE, WQCC, July 30, 2012.

Nutrients Management Control Regulation, Regulation 85, Colorado Department Public Health and Environment, Water Quality Control Commission, effective September 30, 2012.

Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List, Regulation 93, Colorado Department Public Health and Environment, Water Quality Control Commission, effective March 30, 2012.

Policy and Guidance Documents:

Antidegradation Significance Determination for New or Increased Water Quality Impacts, Procedural Guidance, Colorado Department Public Health and Environment, Water Quality Control Division, December 2001.

Memorandum Re: First Update to (Antidegradation) Guidance Version 1.0, Colorado Department Public Health and Environment, Water Quality Control Division, April 23, 2002.

Rationale for Classifications, Standards and Designations of Segments of the Upper Colorado River, Colorado Department Public Health and Environment, Water Quality Control Division, effective December 31 2014.

Policy Concerning Escherichia coli versus Fecal Coliform, CDPHE, WQCD, July 20, 2005.

Colorado Mixing Zone Implementation Guidance, Colorado Department Public Health and Environment, Water Quality Control Division, effective April 2002.

Policy for Conducting Assessments for Implementation of Temperature Standards in Discharge Permits, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-23, effective July 3, 2008.

Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-24, effective March 10, 2008.

Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards Based Effluent Limits, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-19, effective May 2002.